



Psychosocial Consequences of Major Hurricanes and Floods: Range, Duration, and Magnitude of Effects and Risk Factors for Adverse Outcomes

The following is a summary of research findings drawn from a comprehensive review of the disaster mental health literature published in 2002 (Norris et al., 2002; Norris, Friedman, & Watson, 2002) and updated in 2005 (Norris, 2005, www.redmh.org). This summary focuses specifically on the results from the 57 most relevant studies that examined the aftermath of hurricanes (31), floods (20) tornadoes (4) and dam collapses (2). Most of these studies were about adult survivors (45), with the remainder concerned with children (11). Only one sampled rescue/recovery workers.

Range of Outcomes

- Specific psychological problems were identified in most of the studies. Posttraumatic stress or PTSD was found in 74% of the samples, depression or major depression disorder was found in 33% of the samples, and anxiety or generalized anxiety disorder was found in 19% of the samples. Panic disorder and specific phobias were rare. This does not mean that 74% of disaster victims have PTSD but rather than 74% of the studies found some people with PTSD in their samples; exact prevalence rates differ dramatically from one study to the next depending upon a variety of factors.
- Non-specific distress, assessed by means of global indices of psychological and psychosomatic symptoms, was identified in 33% of the studies.
- Health problems and concerns, such as self-reported somatic complaints, verified medical conditions, increased taking of sick leave, elevations in physiological indicators of stress, declines in immune functioning, sleep disruption, increased use of substances (primarily if previously a problem drinker), and (if previously disabled) relapse and illness burden, were identified in 26% of the studies.

Magnitude of Effects

- To provide a rough estimate of the overall impact of the events studied, each sample's results were classified on a 4-point scale of severity. Approximately one in three of these studies documented severe effects of the disaster on the sample or population's mental health.
- Of the 57 selected studies:
 - 3 (5%) showed minimal impairment, meaning that the majority of the sample experienced only transient stress reactions;

- 34 (60%) showed moderate impairment, wherein prolonged but subclinical distress was the predominant result;
- 12 (21%) showed severe impairment, meaning that 25% to 49% of the sample suffered from clinically significant distress or criterion-level psychopathology; and
- 8 (14%) showed very severe impairment, meaning that 50% or more of the sample suffered from clinically significant distress or criterion level psychopathology.
- Of the 45 adult studies, 30% found severe or very severe effects (i.e., a prevalence of mental health problems at or above 25%). Of the 11 child studies, 55% found severe or very severe effects. This difference was not statistically significant for an N of 57.
- Of the 48 studies conducted in developed countries, 29% found severe or very severe effects, whereas 67% of the 9 studies conducted in developing countries found severe or very severe effects. This difference was statistically significant, $p < .05$. Natural disasters in developing countries frequently involve mass fatalities and severe deprivation.

Duration of Effects

- Most included studies had a single postdisaster assessment ($n = 40$, 70%). Samples participating in longitudinal studies were interviewed as late as 17 years postdisaster, but almost half (48% of the longitudinal samples) gave their last interview within 1 year postevent.
- Thirteen panel studies (studies in which the same individuals are interviewed on multiple occasions) identified three primary trends:
 - First, the general rule, observed in the vast majority of studies, was for samples to improve as time passed. These effects were not always simply linear, as outcomes sometimes improved for a while, then stabilized or worsened for awhile, then improved again.
 - Second, levels of symptoms in the early phases of disaster recovery were good predictors of symptoms in later phases. Delayed onsets of psychological disorders were rare.
 - Third, symptoms usually peaked in the first year and were less prevalent thereafter, leaving only a minority of communities and only a minority of individuals within those communities substantially impaired.

Risk Factors

- Severity of exposure:
 - Severity of exposure was universally important. It is perhaps the single most important factor for assessing risk for adverse outcomes.
 - Individual- or household-level severity of exposure was an important predictor of outcomes in almost all samples, as follows: All of the following have been found, at least in some studies, to predict adverse outcomes among survivors:
 - Bereavement

- Injury to self or another family member
- Life threat
- Panic or similar emotions during the disaster
- Horror
- Separation from family (especially among youth)
- Extensive loss of property
- Relocation or displacement
- As the number of these stressors increased, the likelihood of psychological impairment increased.
- In general, injury and life threat were most predictive of long term adverse consequences, especially PTSD.
- Neighborhood- or community-level severity of exposure was assessed only occasionally but had modest outcomes, as follows:
 - Personal loss was more strongly related to increases in negative affect, but community destruction was more strongly related to decreases in positive affect, reflecting a community-wide tendency for people to feel less positive about their surroundings, less enthusiastic, less energetic, and less able to enjoy life.
 - Such findings are an excellent reminder that disasters impact whole communities, not just selected individuals.
- Gender influenced postdisaster outcomes, as follows:
 - In most studies that found gender differences, women or girls were affected more adversely by disasters than men or boys.
 - The effects occurred across a broad range of outcomes, but the strongest effects were for PTSD, for which women's rates often exceeded men's by a ratio of 2:1.
 - The effects of gender were greatest within samples from traditional cultures and in the context of severe exposure.
- Age and experience influenced disaster victims' outcomes, as follows:
 - Older adults were at greater risk than were other adults in only two studies that examined age differences.
 - In the majority of studies where they were differentiated from older and younger adults, middle-aged adults were most adversely affected. Some research suggests that middle-aged adults are most at risk because they have greater stress and burden even before the disaster strikes and assume even greater obligations afterwards.

- Cross-cultural research suggests that the effects of age may differ across countries according to the social, political, economic, and historical context of the setting involved.
- At least in lower magnitude disasters, prior experience with the specific type of event may reduce anxiety. People who have experienced disasters previously show higher levels of hazard preparedness and are more likely to evacuate when authorities suggest they do.
- Professionalism and training increase the resilience of recovery workers, although past trauma per se does not.
- Ethnicity shaped the outcomes of disaster victims in some studies, as follows:
 - Among youth, results for ethnicity were not entirely consistent. However, ethnic minority youth were at greater risk than others in a few studies, where effects of ethnicity were studied.
 - Among adults, results for ethnicity were quite consistent. Ethnic minority adults were at greater risk than others in those studies that documented some effect of ethnicity.
 - There is little explanatory research available, but the disproportionate risk of ethnic minorities appears to follow both from differential exposure to more severe aspects of the disaster and from culturally specific attitudes and beliefs that may impede seeking help.
- Socioeconomic Status (SES), as manifest in education, income, literacy, or occupational prestige, affected outcomes in a number of studies of disaster victims. In almost all of these, lower SES was associated with greater postdisaster distress. The effect of SES has been found to grow stronger as severity of exposure increases.
- Family Factors influenced outcomes in several studies, as follows:
 - Husbands' symptom severity predicts wives' symptoms and vice versa. Marital stress has been found to increase after disasters.
 - Being a parent also added to the stressfulness of disaster recovery and, especially for events involving uncertain threats, mothers were especially at risk for substantial distress.
 - Children were highly sensitive to postdisaster distress and conflict in the family. Parental psychopathology was typically the best predictor of child psychopathology. Less irritable, more supportive, and healthier parents had healthier children.
- Predisaster Functioning and Personality influenced outcomes in numerous samples, as follows:
 - Persons with predisaster psychiatric histories were disproportionately likely to develop disaster-specific PTSD and to be diagnosed with some type of postdisaster disorder.
 - In prospective studies, participants with higher predisaster symptoms were more strongly affected by the disaster than were participants with lower predisaster symptoms.
 - A "neurotic," as opposed to stable and calm, personality increases the likelihood of postdisaster distress. "Hardiness" decreases the likelihood of postdisaster distress.
- Secondary Stressors when measured were almost always important, as follows:

- Both life-event stress (discrete changes) and chronic stress were strong predictors of survivors' health outcomes. Moreover, stability and change in psychological symptoms were largely explained by stability and change in stress and resources.
- In part, the long-term effects of acute stressors (the individual-level aspects of exposure outlined above) on psychological distress operate through their effects on chronic stressors, such as marital stress, financial stress, and ecological stress.
- Attention needs to be paid to stress levels in stricken communities long after the disaster has happened and passed.
- Psychosocial resources were likewise important in all relevant studies, as follows:
 - Ways of coping influenced symptom outcomes in several studies, but the findings were not always consistent across them. Avoidance coping and blame assignment were consistently problematic, but other ways of coping were sometimes helpful and sometimes not.
 - Beliefs about coping were far more important than ways of coping. What matters, apparently, is not how individuals actually cope but rather how they perceive their capabilities to cope.
 - Self-efficacy, mastery, perceived control, self-esteem, hope, and optimism all are related positively, strongly, and consistently to mental health.
 - Social embeddedness -- the size, activeness, and closeness of the survivor's network is related strongly and consistently to mental health.
 - Received social support is the actual helping behavior that emerges in response to stress. Although it usually is related positively to mental health, the findings are not entirely consistent, in part because levels of help received are confounded with need. Received support is important primarily because it protects and replenishes other resources, such as perceived social support.
 - Perceived social support is the most thoroughly researched social resource. With few exceptions, disaster survivors who subsequently believe that they are cared for by others and that help will be available, if needed, fare better psychologically than disaster survivors who believe they are unloved and alone.
 - Resource Deterioration. The extent to which resources were lost may be the single most important thing to understand about a postdisaster environment, as indicated by the following research:
 - Global indices of resource loss show that the greater the amount of resource loss, regardless of the specific resources, the greater the psychological distress. Several studies have found such measures to be the strongest predictor of symptom outcomes.
 - The Social Support Deterioration Model, which has been tested across several disasters, indicates that declines in perceived social support account for a share of victims' subsequent declines in mental health. A variant of the original model showed that support received after the disaster offset the detrimental effects of disaster exposure on subsequent levels of perceived (expected) social support. Attending to the social needs of disaster victims could go a long way towards protecting them from long-term adverse psychological consequences.

Summary

- Approximately one in three major disasters of water and wind (hurricanes, floods) may be expected to produce a high prevalence of psychological problems.
- Most people will get better over time. Some will not without help.
- An adult's risk will increase linearly along with the number of these factors that are present:
 - Severe exposure to the disaster, especially injury, threat to life, and extreme loss
 - Living in a highly disrupted or traumatized community
 - Female gender
 - Age in the middle years of 40 to 60
 - Little previous experience or training relevant to coping with the disaster
 - Ethnic minority group membership
 - Poverty or low socioeconomic status
 - The presence of children in the home
 - A significantly distressed spouse
 - Psychiatric history
 - Secondary stress
 - Weak or deteriorating psychosocial resources
- With a few modifications – primarily the deletion of age -- this risk-factor model holds reasonably well for children and adolescents.

Implications for Interventions

- Families are extremely important systems and constitute the most important unit for postdisaster treatment and intervention efforts. Interventions for children may be of limited effectiveness if the family is not considered as a whole. In fact, providing care and support to their overly stressed parents might be among the most effective ways to provide care and support to the children affected by disaster.
- It is important to provide support to the supporters, especially wives and mothers.
- We should educate survivors, and those who come into contact with them, that avoidance and blame assignment are rarely effective coping strategies. Otherwise, however, the specific ways of coping matter much less than do people's perceptions of themselves as able to cope and control outcomes. It may be more important for disaster workers to reassure survivors that they do, in fact, have what it takes to meet the demands faced.
- A focus on self-efficacy does not mean that mental health services are not needed, but rather that such services should be delivered in a way that provides resources without threatening them. Some

people are more likely to accept help for "problems in living" than to accept help for "mental health problems." In exercising our good intentions to help victims, we must not inadvertently rob them of the very psychological resources they need to persevere over the long term.

- Naturally occurring social resources are particularly vital for disaster victims. Professionals and outsiders are important sources of assistance when the level of need is high, but they must not and cannot supplant natural helping networks. People should not abandon their routine social activities because these keep people informed about the relative needs of network members, provide natural forums for sharing experiences, and preserve a sense of social embeddedness. It also might be helpful to educate the public about the reasons significant others may not always be able to provide them with the quality or quantity of interpersonal support they expect.
- Interventions must address both psychological and social/community needs. They should be reserved for those persons who are most distressed, who had weak psychological and social resources to begin with, or who suffered particularly dire resource losses. If it is recalled that resources must be invested in order to acquire new ones, it will be understood that the people who need such services the most may be least likely to seek them. Outreach to such persons, and to the communities in which they are most likely to live, is essential.

For References and Further Detail

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